

CLAIMS

What is claimed is:

1. A hydraulic system for controllably moving an apron and a bucket of an earth moving apparatus comprising:
 - a hydraulic fluid supply means;
 - a first hydraulic propulsion means for moving the apron;
 - a second hydraulic propulsion means for moving the bucket;
 - a first control means for controlling the flow of the hydraulic fluid from the hydraulic fluid supply means to the first and second propulsion means; and
 - a second control means for selectively controlling the flow of hydraulic fluid to the first propulsion means or the second propulsion means to selectively restrict movement of the apron or the bucket upon activation of the second control means.
2. The hydraulic system of claim 1, further comprising:
 - a first hydraulic supply line operatively connecting the first control means to the first propulsion means; and
 - a second hydraulic supply line operatively connecting the first control means to the second propulsion means.
3. The hydraulic system of claim 2, wherein the second control means is operatively connected to the first hydraulic supply line or the second hydraulic supply line.
4. The hydraulic system of claim 1, wherein the first control means comprises a sequence valve.
5. The hydraulic system of claim 1, further comprising a switching means for controlling the second control means.

6. The hydraulic system of claim 5, wherein the switching means for controlling the second control means is electronic.

7. The hydraulic system of claim 5, wherein the switching means for controlling the second control means is activated separately from the hydraulic system.

8. The hydraulic system of claim 3, wherein the second control means is operatively connected to the second hydraulic supply line such that activation of the second control means prevents the bucket from moving and imparts movement to the apron.

9. An earth moving or ground leveling apparatus comprising:
a frame having opposing sides;
at least two ground engaging wheels supporting the frame;
a bucket having a floor and a pair of side walls;
an apron for holding soil in the bucket, the apron disposed perpendicular to the pair of sidewalls and disposed across the front of the bucket;
a hydraulic system for imparting movement to the bucket and the apron comprising:
a first valve interconnected in the hydraulic system for controlling movement of the bucket and the apron; and
a second valve interconnected in the hydraulic system for preventing movement of the bucket or the apron.

10. The earth moving or ground leveling apparatus of claim 9, wherein the first valve comprises a sequence valve for sequentially moving the bucket and the apron to one of a soil scraping, retaining or expelling position where the bucket is actuated only after the apron is fully moved.

11. The earth moving or ground leveling apparatus of claim 9, wherein the second valve is configured to be activated independently from the hydraulic system.

12. The earth moving or ground leveling apparatus of claim 9, further comprising an electronic control means for activating the second valve.

13. The earth moving or ground leveling apparatus of claim 9, wherein the bucket can be locked in a position and the apron can be independently actuated to control the amount of soil entering or leaving the bucket.

14. The earth moving or ground leveling apparatus of claim 9, wherein the hydraulic system further comprises:

a first hydraulic cylinder for moving the bucket;

a second hydraulic cylinder for moving the apron;

at least one first supply line operatively connecting the first valve to the first hydraulic cylinder; and

at least one second supply line operatively connecting the first valve to the second hydraulic cylinder.

15. The earth moving or ground leveling apparatus of claim 13, wherein the second valve is operatively connected to the at least one first supply line or the at least one second supply line.

16. The earth moving or ground leveling apparatus of claim 12, further comprising:
a tongue attached to the frame and configured for attachment of the earth moving or ground leveling apparatus to a tractor;
wherein the electronic control means is associated with the tractor.

17. A method for the movement of a bucket and an apron of an earth moving apparatus, /
the method comprising:
moving a bucket into a lowered position;
locking the bucket in the lowered position; and
controlling movement of an apron independently to control the amount of soil entering or leaving the bucket.

18. A method for controlling movement of a bucket and an apron of an earth moving apparatus, the method comprising:
providing the earth moving apparatus comprising the bucket for storing soil and the apron for holding the soil in the bucket;
providing a hydraulic system comprising a first hydraulic cylinder for moving the bucket, a second hydraulic cylinder for moving the apron and a first valve for controlling the movement of the bucket and the apron;
activating the hydraulic system to initiate movement of the bucket and the apron; and,
impeding the movement of the bucket or the apron with a second valve.

19. The method according to claim 16, wherein the first valve comprises a sequence valve.

20. The method according to claim 16, wherein impeding the movement of the bucket or the apron comprises activating an electronic means.

21. The method according to claim 16, wherein activation of the hydraulic system causes the bucket and the apron to move in sequence.

22. The method according to claim 19, wherein the impeded movement of the bucket or the apron does not affect the movement of the unimpeded bucket or apron.

23. The method according to claim 16, wherein impeding the movement of the bucket or the apron comprises interrupting a flow of hydraulic fluid to the first hydraulic cylinder or the second hydraulic cylinder.

24. The method according to claim 18, further comprising:
impeding the movement of the bucket with the electronic means; and
moving the apron.

25. An earth moving or ground leveling apparatus comprising:
a frame having opposing sides;
at least two ground engaging wheels supporting the frame;
a bucket having a floor and a pair of side walls;
a movable wall located perpendicular to the pair of side walls;
a propulsion means for imparting movement to the movable wall; and
a lever means for transferring a force from the propulsion means to the movable wall.

26. The earth moving or ground leveling apparatus of claim 23, further comprising a hydraulic system comprising:
an inlet conduit for supplying hydraulic fluid to the propulsion means;
an outlet conduit for removing the hydraulic fluid from the propulsion means;
a by-pass line for connecting the inlet conduit to the outlet conduit; and
a diversion means for diverting the hydraulic fluid removed from the propulsion means to enter the by-pass line.

27. The earth moving or ground leveling apparatus of claim 23, wherein the lever means comprises:
a lever oriented substantially perpendicular to the propulsion means;
wherein the propulsion means is attached to the lever at a location substantially equidistant from opposing ends of the lever;
a rod having a first end and a second end;
wherein the rod is oriented substantially parallel to the propulsion means;
the first end of the rod being attached to one end of the lever; and
the second end of the rod being attached to the movable wall.

28. The earth moving or ground leveling apparatus of claim 24, wherein the diversion means comprises a pressure sensing valve, a mechanically operated valve, an electrically operated valve, a pneumatically operated valve, or a hydraulically activated valve.

29. The earth moving or ground leveling apparatus of claim 23, further comprising a tongue attached to the frame and configured for attachment of the earth moving or ground leveling apparatus to a tractor.

30. An earth moving or ground leveling apparatus comprising:
a frame having opposing sides;
at least two ground engaging wheels supporting the frame;
a bucket having a floor and a pair of side walls;
a movable wall located perpendicular to the pair of side walls;
a hydraulic cylinder for imparting movement to the movable wall;
wherein the hydraulic cylinder is oriented substantially vertically; and
a linkage means for imparting movement of the movable wall;
wherein the linkage means transfers a vertical force generated by the hydraulic cylinder to a perpendicular force that imparts movement to the movable wall.

31. The earth moving or ground leveling apparatus of claim 28, wherein the hydraulic cylinder is operatively connected to a hydraulic system comprising:
an inlet conduit for supplying hydraulic fluid to the hydraulic cylinder;
an outlet conduit for removing the hydraulic fluid from the hydraulic cylinder;
a by-pass line for connecting the inlet conduit to the outlet conduit; and
a diversion means for diverting the hydraulic fluid removed from the hydraulic cylinder to enter the by-pass line.

32. The earth moving or ground leveling apparatus of claim 28, wherein the diversion means comprises a pressure sensing valve, a mechanically operated valve, an electrically operated valve, a pneumatically operated valve, or a hydraulically activated valve.

33. The earth moving or ground leveling apparatus of claim 28, further comprising a tongue attached to the frame and configured for attachment of the earth moving or ground leveling apparatus to a tractor.

34. An improved earth moving or ground leveling apparatus having a frame with opposing sides, at least two ground engaging wheels supporting the frame, a bucket with a floor and a pair of sidewalls, and a movable wall located adjacent to the pair of sidewalls, the improvement comprising:

a hydraulic cylinder for imparting movement to the movable wall;

wherein the hydraulic cylinder is oriented substantially vertically in relation to the ground.

35. The improved earth moving apparatus of claim 32, further comprising a tongue attached to the frame and configured for attachment of the earth moving or ground leveling apparatus to a tractor.

36. A method for the controlled expulsion of the contents of a bucket of an earth moving apparatus, the method comprising:

providing the earth moving apparatus comprising the bucket for storing soil with a movable wall perpendicular to a pair of side walls and opposite an exit for the soil;

providing a hydraulic system comprising a hydraulic cylinder for moving the movable wall, the hydraulic cylinder disposed perpendicular to the pair of side walls and operably connected to the moveable wall through a linkage; and

activating the hydraulic system to move the hydraulic cylinder in a direction parallel the moveable wall to initiate movement of the movable wall in a generally perpendicular direction.